

## Features

- AEC-Q101 Qualified
- High Density Cell Design for Low RDS(ON)
- Voltage Controlled Small Signal Switch
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free. "Green" Device <sup>(1)</sup>
- Moisture Sensitivity Level 1
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

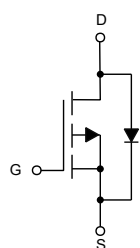
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- Thermal Resistance: 400°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate-Source Voltage	V <sub>GS</sub>	±10	V
Continuous Drain Current	I <sub>D</sub>	T <sub>A</sub> =25°C	-1.2
		T <sub>A</sub> =70°C	-1.0
Pulsed Drain Current <sup>(Note 2)</sup>	I <sub>DM</sub>	-9.6	A
Total Power Dissipation	P <sub>D</sub>	300	mW

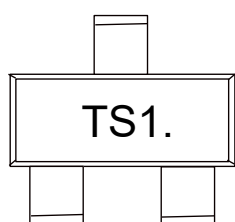
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

2. Repetitive rating; pulse width limited by max. junction temperature.

## Internal Structure and Marking Code

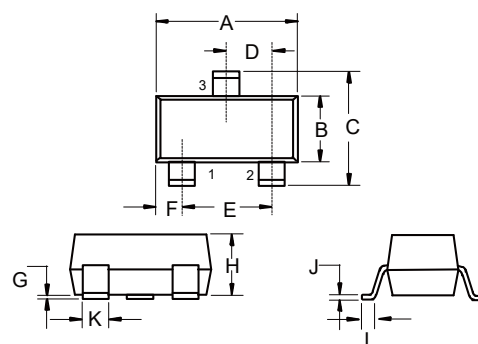


1. GATE
2. SOURCE
3. DRAIN



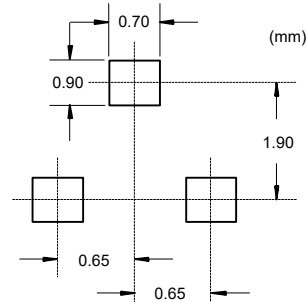
# P-Channel MOSFET

## SOT-323



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.071	0.087	1.80	2.20	
B	0.045	0.053	1.15	1.35	
C	0.083	0.096	2.10	2.45	
D	0.026		0.65		TYP.
E	0.047	0.055	1.20	1.40	
F	0.012	0.016	0.30	0.40	
G	0.000	0.004	0.00	0.10	
H	0.035	0.044	0.90	1.10	
J	0.002	0.010	0.05	0.25	
K	0.006	0.016	0.15	0.40	
L	0.010	0.018	0.26	0.46	

### Suggested Solder Pad Layout



**ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)**

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate-Threshold Voltage <sup>(3)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.3	-0.6	-1.0	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$			-1.0	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$			$\pm 100$	nA
Drain-Source On-Resistance <sup>(3)</sup>	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-1.5A$		100	130	m $\Omega$
		$V_{GS}=-2.5V, I_D=-1.2A$		135	170	
		$V_{GS}=-1.8V, I_D=-1.0A$		180	250	
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-2.0A$		-0.9	-1.2	V
<b>Dynamic Characteristics</b>						
Input Capacitance <sup>(4)</sup>	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$		210		pF
Output Capacitance <sup>(4)</sup>	$C_{oss}$			37		
Reverse Transfer Capacitance <sup>(4)</sup>	$C_{rss}$			30		
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-4.5V, V_{GS}=-10V, I_D=-1.2A$		2.9		nC
Gate-Source Charge	$Q_{gs}$			0.65		
Gate-Drain Charge	$Q_{gd}$			0.7		
Reverse Recovery Time	$t_{rr}$	$I_{SD}=-1.2A, di/dt=60A/\mu s$		5.4		ns
Reverse Recovery Charge	$Q_{rr}$			0.9		nC
Turn-On Delay Time <sup>(4)</sup>	$t_{d(on)}$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-1.2A, R_G=3\Omega$		4.8		ns
Turn-On Rise Time <sup>(4)</sup>	$t_r$			22		
Turn-off Delay Time <sup>(4)</sup>	$t_{d(off)}$			21		
Turn-Off Fall Time <sup>(4)</sup>	$t_f$			28		

 Note: 3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

4. These Parameters Have No Way to Verify.

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

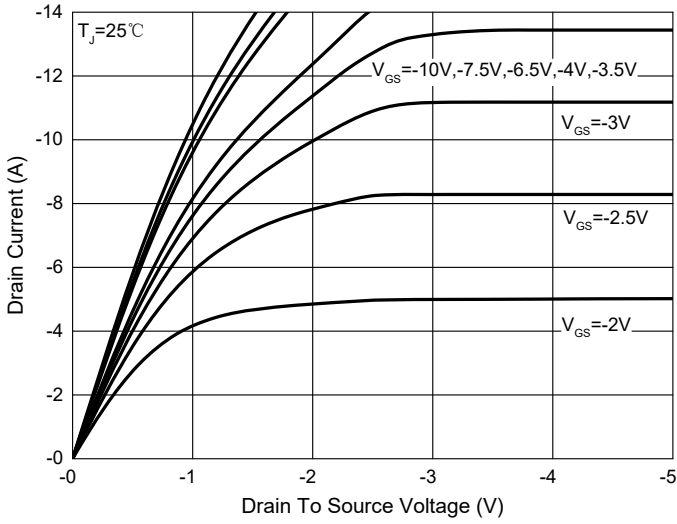


Fig. 2 - Transfer Characteristics

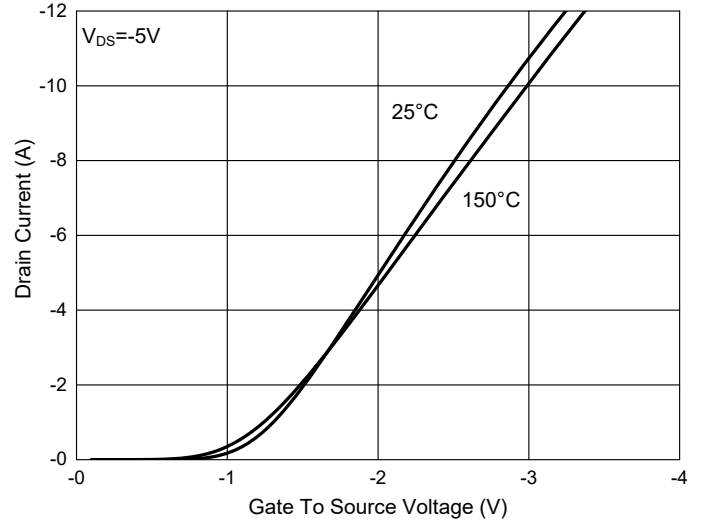


Fig. 3 -  $R_{DS(ON)} - I_D$

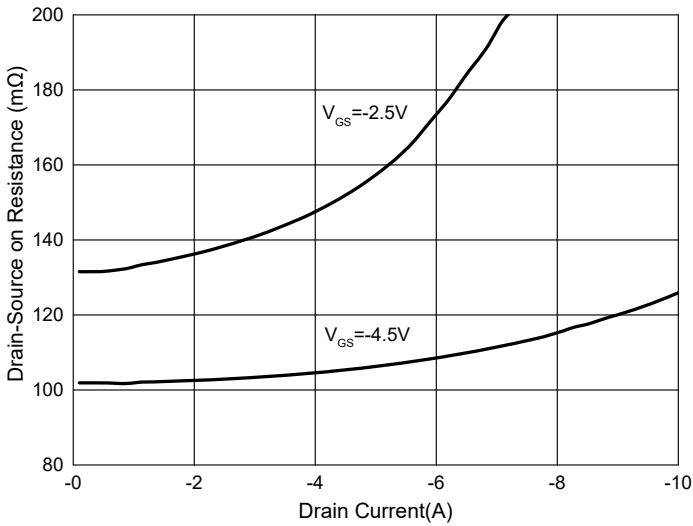


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

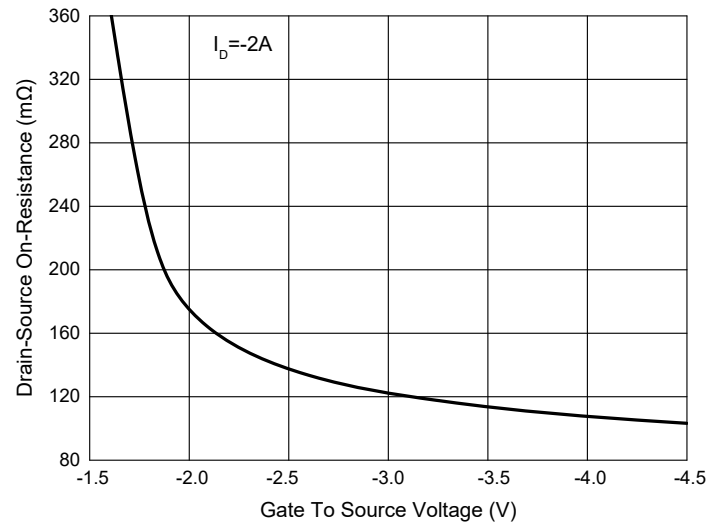


Fig. 5 -  $I_S - V_{SD}$

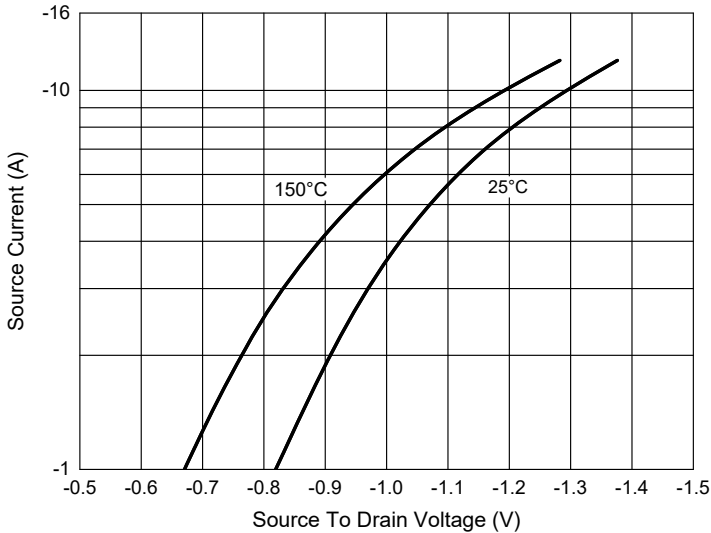
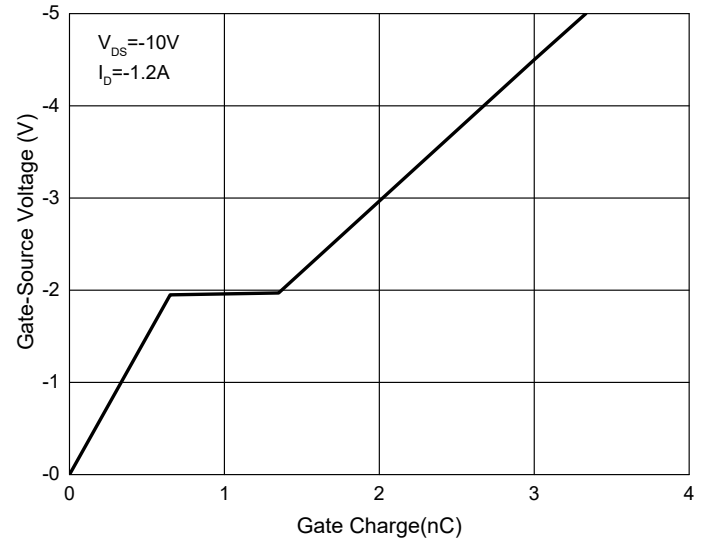


Fig. 6 - Gate Charge



**Curve Characteristics**

Fig. 7 - Normalized On Resistance Characteristics

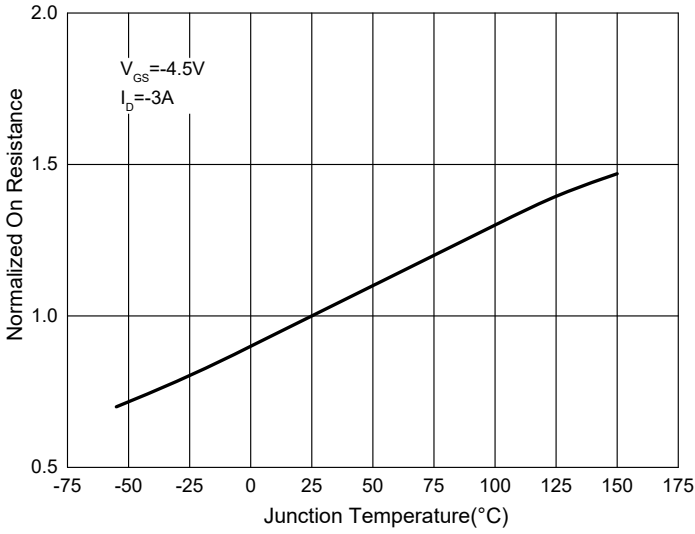


Fig. 8 - Capacitance Characteristics

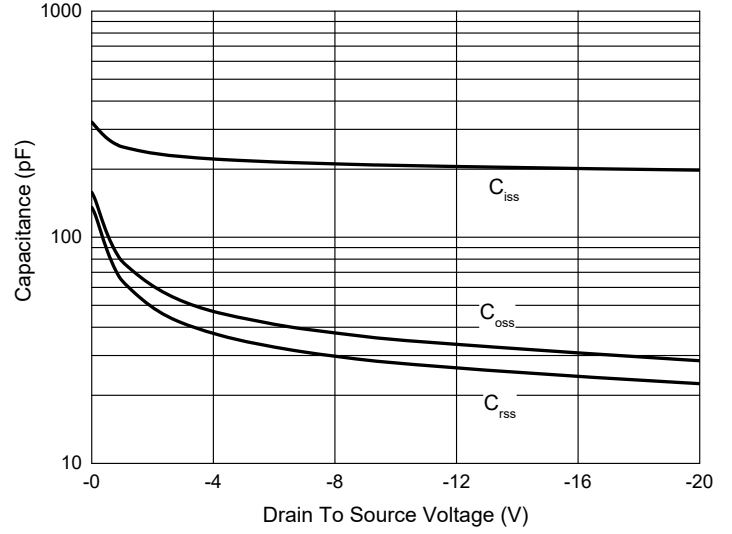


Fig. 9 - Safe Operation Area

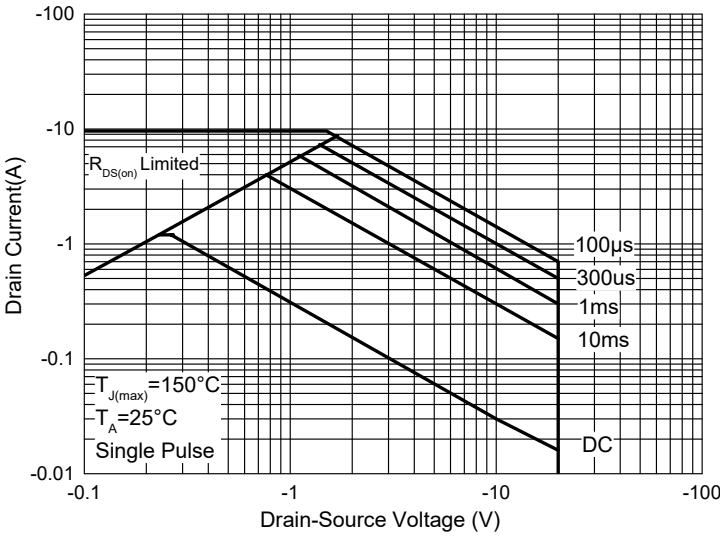
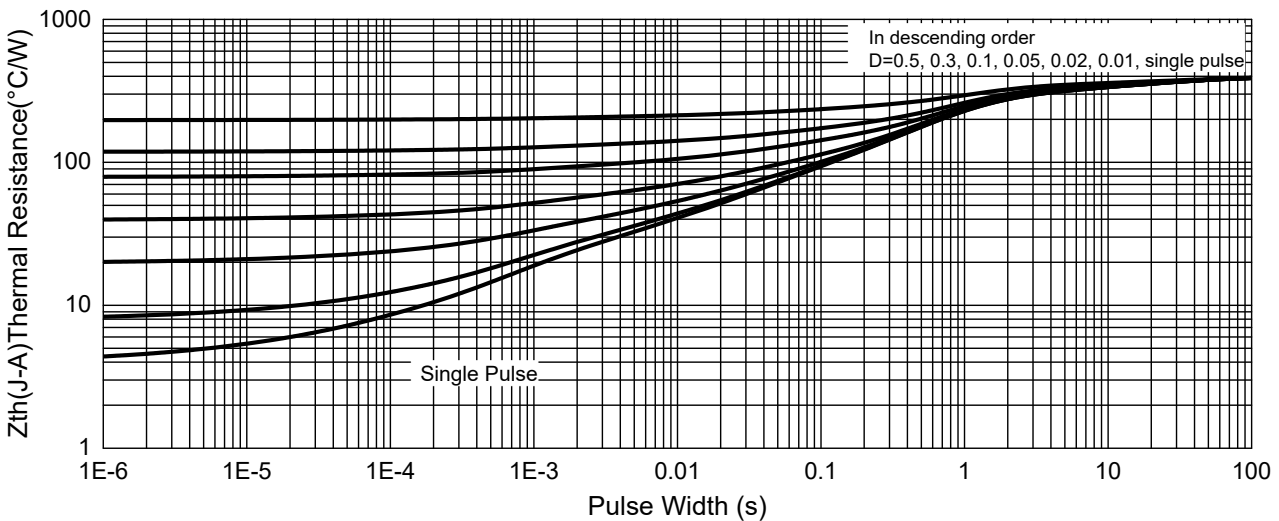


Fig. 10 - Maximum Transient Thermal Impedance



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:3Kpcs/Reel

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